

### *Claims*

This listing of claims will replace all prior versions, and listings of claims in the application.

1.     *(Previously Presented)* A digital modulator circuit for receiving a digital input signal and converting the digital input signal into an audio band signal, comprising:

modulation means for amplifying and summing information components of the digital input signal; and

a modulation feedback loop containing at least part of said modulation means, said modulation feedback loop including:

a quantizer having an input that receives a value based on the digital input signal and having an output representing a quantized level containing said value, and

a mapper connected to receive said quantizer output and having a mapper output that transmits pulses whose pulse width is a function of said quantizer output.

2.     *(Previously Presented)* A digital modulator circuit for receiving a digital input signal and converting the digital input signal into an audio band signal, comprising:

modulation means for amplifying and summing information components of the digital input signal; and

a modulation feedback loop containing at least part of said modulation means, said modulation feedback loop including:

a quantizer having an input that receives a value based on the digital input signal and having an output representing a quantized level containing said value, and

a mapper connected to receive said quantizer output and having a mapper output that transmits pulses whose pulse width is a function of said quantizer output;

wherein the circuit is part of a cable television receiver.

3. (*Previously Presented*) The circuit of claim 1 wherein said mapper comprises:

table means for defining at least first and second possible pulses, each having a bit sequence corresponding to the same quantized level;

pulse generation means for selectively generating one of said possible pulses corresponding to said quantized level as an output pulse at the mapper output; and

control means for controlling said pulse generation means such that when said possible pulses corresponding to said quantized level are different, over time a similar number of each of said possible pulses is provided at the mapper output.

4. (*Original*) The circuit of claim 3, wherein said control means comprises means for selectively providing one of said first and second pulses by

alternating between said possible pulses each time said quantized level is received.

5.       (*Original*) The circuit of claim 3, wherein said table means further comprises means for defining at least first and second pulse sets, each pulse set comprising a bit sequence corresponding to each of a plurality of quantized levels.

6.       (*Original*) The circuit of claim 5, wherein said control means further comprises means for alternating the pulse set from which the mapper output is taken each time said digital level is received at the mapper input, for at least those quantized levels where said pulse sets have different pulses corresponding to such quantized level.

7.       (*Original*) The circuit of claim 5, wherein said control means further comprises means for selecting said mapper output from said first and second pulse sets by alternating between said first and second pulse sets, for at least those quantized levels where said pulse sets have different pulses corresponding to such quantized level.

8.       (*Original*) The circuit of claim 7, wherein the pulses in each pulse set have similar time domain centroids, at least for those quantized levels where said pulse sets have differing pulses corresponding to such quantized level.

9.       *(Previously Presented)* A digital modulator circuit for receiving a digital input signal and converting the digital input signal into an audio band signal, comprising:

          a modulation circuit for amplifying and summing information components of the digital input signal; and

          a feedback loop associated with said modulation circuit, said feedback loop including:

                    quantizer means for receiving a value at a quantizer input based on the digital input signal and generating a signal at a quantizer output representing a quantized level containing said value, and

                    mapper means for receiving said quantizer output and generating a mapper output containing pulses with a pulse width that is a function of said quantizer output.

10.       *(Previously Presented)* A digital modulator circuit for receiving a digital input signal and converting the digital input signal into an audio band signal, comprising:

          modulation means for amplifying and summing information components of the digital input signal in a feedback loop, said feedback loop comprising:

                    quantizer means for receiving a value at a quantizer input based on the digital input signal and generating a signal at a quantizer output representing a quantized level containing said value; and

mapper means for receiving said quantizer output and generating a mapper output containing pulses whose pulse width is a function of said quantizer output,

wherein the circuit is part of a cable television receiver.

11. *(Previously Presented)* The circuit of claim 9 wherein said mapper means further comprises:

table means for defining at least first and second possible pulses, each having a bit sequence corresponding to the same quantized level;

pulse generation means for selectively generating one of said possible pulses corresponding to said quantized level as an output pulse at the mapper output; and

control means for controlling said pulse generation means such that when said possible pulses corresponding to said quantized level are different, over time a similar number of each of said possible pulses is provided at the mapper output.

12. *(Original)* The circuit of claim 11, wherein said control means comprises means for selectively providing one of said first and second pulses by alternating between said possible pulses each time said quantized level is received.

13. *(Original)* The circuit of claim 11, wherein said table means further comprises means for defining at least first and second pulse sets, each

pulse set defining a bit sequence corresponding to each of a plurality of quantized levels.

14.     *(Original)* The circuit of claim 13, wherein said control means further comprises means for alternating the pulse set from which the mapper output is taken each time said digital level is received at the mapper input, for at least those quantized levels where said pulse sets have different pulses corresponding to such quantized level.

15.     *(Original)* The circuit of claim 13, wherein said control means further comprises means for selecting said mapper output from said first and second pulse sets by alternating between said first and second pulse sets, for at least those quantized levels where said pulse sets have different pulses corresponding to such quantized level.

16.     *(Original)* The circuit of claim 15, wherein the pulses in each pulse set have similar time domain centroids, at least for those quantized levels where said pulse sets have differing pulses corresponding to such quantized level.

17.     *(Previously Presented)* A modulator circuit receiving a modulator input signal and producing a mapper output signal, comprising:

        a filter producing an output signal which is a function of the modulator input signal and of said mapper output signal,

a quantizer having an input that receives said filter output signal and having an output that produces a quantized representation of said filter output signal, and

a mapper connected to receive said quantizer output and having a mapper output that transmits the mapper output signal, where the mapper output signal provides pulses whose pulse energy is a function of said quantizer output.

18. *(Previously Presented)* A modulator circuit receiving a modulator input signal and producing a mapper output signal, comprising:

a filter producing an output signal which is a function of the modulator input signal and of said mapper output signal,

a quantizer having an input that receives said filter output signal and having an output that produces a quantized representation of said filter output signal, and

a mapper connected to receive said quantizer output and having a mapper output that transmits the mapper output signal, where the mapper output signal provides pulses whose pulse width is a function of said quantizer output.

19. *(Previously Presented)* The circuit of claim 18, wherein said quantizer produces an output signal at a first rate.

20. *(Previously Presented)* The circuit of claim 19, wherein said mapper receives said quantizer output signal at said first rate and transmits pulses at a second rate.

21.     *(Previously Presented)* The circuit of claim 20, wherein said first rate is slower than said second rate.

22.     *(Previously Presented)* The circuit of claim 17, wherein said quantizer produces an output signal at a first rate.

23.     *(Previously Presented)* The circuit of claim 22, wherein said mapper receives said quantizer output signal at said first rate and transmits pulses at a second rate.

24.     *(Previously Presented)* The circuit of claim 23, wherein said first rate is slower than said second rate.